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Patent 09/627,486

IN THE CLAIMS

Amend the claims as indicated below.

1 1. (currently amended) A system for real-time buying and selling of
2 bandwidth, and routing of excess traffic over bandwidth purchased in real time, the
3 system comprising:
4 a router that routes a plurality of data packets from a number of network users to a
5 number of backbone providers, the router having:
6 a number of input ports that receive data packets,
7 a number of output ports that transmit the data packets to the backbone
8 providers,
9 switching circuitry that measures a traffic level on each of the input ports,
10 identifies types of data packets, and outputs traffic information in response thereto,
11 a switch controller that receives the traffic information from the traffic
12 measuring circuitry and a number of routing instructions, and controls the switching
13 circuitry in response thereto; and
14 a route optimizer connected to the router, the route optimizer receiving operating
15 instructions, and generating the routing instruction for each input port in response thereto,
16 the routing instructions including a first routing instruction that identifies an output port
17 connected to a fixed-capacity bandwidth provider that can receive data packets up to a
18 first traffic level, and a second routing instruction that indicates that data packets in
19 excess of the first traffic level are to be output to a usage-based bandwidth provider that
20 offers capacity on an as-needed basis, wherein the route optimizer identifies the usage-
21 based bandwidth provider as a lowest cost provider that meets a predetermined maximum
22 response time.

1 2. (currently amended) ~~The system of claim 1~~ A system for real-time buying
2 and selling of bandwidth, and routing of excess traffic over bandwidth purchased in real
3 time, the system comprising:

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4 a router that routes a plurality of data packets from a number of network users to a
5 number of backbone providers, the router having:
6 a number of input ports that receive data packets,
7 a number of output ports that transmit the data packets to the backbone
8 providers,
9 switching circuitry that measures a traffic level on each of the input ports,
10 identifies types of data packets, and outputs traffic information in response thereto,
11 a switch controller that receives the traffic information from the traffic
12 measuring circuitry and a number of routing instructions, and controls the switching
13 circuitry in response thereto; and
14 a route optimizer connected to the router, the route optimizer receiving operating
15 instructions, and generating the routing instruction for each input port in response thereto,
16 the routing instructions including a first routing instruction that identifies an output port
17 connected to a fixed-capacity bandwidth provider that can receive data packets up to a
18 first traffic level, and a second routing instruction that indicates that data packets in
19 excess of the first traffic level are to be output to a usage-based bandwidth provider that
20 offers capacity on an as-needed basis, wherein the route optimizer identifies the usage-
21 based bandwidth provider as a lowest cost provider from a list of providers that have
22 capacity.

1 Claim 3 (canceled).

2 4. (currently amended) The system of claim 1 ~~claim 3~~ wherein the route
3 optimizer measures response time to end destinations provided by the usage-based
4 bandwidth providers.

1 5. (currently amended) ~~The system of claim 1 and further comprising A~~
2 system for real-time buying and selling of bandwidth, and routing of excess traffic over
3 bandwidth purchased in real time, the system comprising:
4 a router that routes a plurality of data packets from a number of network users to a
5 number of backbone providers, the router having:
6 a number of input ports that receive data packets,

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7 a number of output ports that transmit the data packets to the backbone
8 providers.
9 switching circuitry that measures a traffic level on each of the input ports,
10 identifies types of data packets, and outputs traffic information in response thereto.
11 a switch controller that receives the traffic information from the traffic
12 measuring circuitry and a number of routing instructions, and controls the switching
13 circuitry in response thereto;
14 a route optimizer connected to the router, the route optimizer receiving operating
15 instructions, and generating the routing instruction for each input port in response thereto.
16 the routing instructions including a first routing instruction that identifies an output port
17 connected to a fixed-capacity bandwidth provider that can receive data packets up to a
18 first traffic level, and a second routing instruction that indicates that data packets in
19 excess of the first traffic level are to be output to a usage-based bandwidth provider that
20 offers capacity on an as-needed basis; and
21 a billing system that collects raw transaction data that indicates a bandwidth
22 provider that has received an outgoing data packet.

1 6. (previously presented) The system of claim 5 and further comprising a
2 trading platform that outputs the operating instruction in response to user instructions.

1 7. (currently amended) ~~The system of claim 1~~ A system for real-time buying
2 and selling of bandwidth, and routing of excess traffic over bandwidth purchased in real
3 time, the system comprising:
4 a router that routes a plurality of data packets from a number of network users to a
5 number of backbone providers, the router having:
6 a number of input ports that receive data packets,
7 a number of output ports that transmit the data packets to the backbone
8 providers,
9 switching circuitry that measures a traffic level on each of the input ports,
10 identifies types of data packets, and outputs traffic information in response thereto.

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11 a switch controller that receives the traffic information from the traffic
12 measuring circuitry and a number of routing instructions, and controls the switching
13 circuitry in response thereto;
14 a route optimizer connected to the router, the route optimizer receiving operating
15 instructions, and generating the routing instruction for each input port in response thereto,
16 the routing instructions including a first routing instruction that identifies an output port
17 connected to a fixed-capacity bandwidth provider that can receive data packets up to a
18 first traffic level, and a second routing instruction that indicates that data packets in
19 excess of the first traffic level are to be output to a usage-based bandwidth provider that
20 offers capacity on an as-needed basis, wherein a right to output data packets to the fixed-
21 capacity bandwidth provider is secured prior to the traffic level exceeding the first traffic
22 level.

1 8. (currently amended) ~~The system of claim 1~~ A system for real-time buying
2 and selling of bandwidth, and routing of excess traffic over bandwidth purchased in real
3 time, the system comprising:
4 a router that routes a plurality of data packets from a number of network users to a
5 number of backbone providers, the router having:
6 a number of input ports that receive data packets,
7 a number of output ports that transmit the data packets to the backbone
8 providers,
9 switching circuitry that measures a traffic level on each of the input ports,
10 identifies types of data packets, and outputs traffic information in response thereto,
11 a switch controller that receives the traffic information from the traffic
12 measuring circuitry and a number of routing instructions, and controls the switching
13 circuitry in response thereto;
14 a route optimizer connected to the router, the route optimizer receiving operating
15 instructions, and generating the routing instruction for each input port in response thereto,
16 the routing instructions including a first routing instruction that identifies an output port
17 connected to a fixed-capacity bandwidth provider that can receive data packets up to a
18 first traffic level, and a second routing instruction that indicates that data packets in
19 excess of the first traffic level are to be output to a usage-based bandwidth provider that

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20 offers capacity on an as-needed basis, wherein a right to output data packets to the usage-
21 based bandwidth provider is secured at a time that usage-based bandwidth is needed.

1 9. (currently amended) ~~The system of claim 1~~ A system for real-time buying
2 and selling of bandwidth, and routing of excess traffic over bandwidth purchased in real
3 time, the system comprising:
4 a router that routes a plurality of data packets from a number of network users to a
5 number of backbone providers, the router having:
6 a number of input ports that receive data packets,
7 a number of output ports that transmit the data packets to the backbone
8 providers,
9 switching circuitry that measures a traffic level on each of the input ports,
10 identifies types of data packets, and outputs traffic information in response thereto,
11 a switch controller that receives the traffic information from the traffic
12 measuring circuitry and a number of routing instructions, and controls the switching
13 circuitry in response thereto;
14 a route optimizer connected to the router, the route optimizer receiving operating
15 instructions, and generating the routing instruction for each input port in response thereto,
16 the routing instructions including a first routing instruction that identifies an output port
17 connected to a fixed-capacity bandwidth provider that can receive data packets up to a
18 first traffic level, and a second routing instruction that indicates that data packets in
19 excess of the first traffic level are to be output to a usage-based bandwidth provider that
20 offers capacity on an as-needed basis, wherein the routing instructions further include a
21 real-time overflow capacity routing instruction that indicates that overflow traffic from
22 the network user is to be output to a best backbone provider at the time the overflow
23 traffic occurs.

1 10. (previously presented) A method for handling overflow traffic for a
2 bandwidth user that has purchased a total fixed amount of bandwidth capacity, the
3 bandwidth user outputting traffic to an input port, the traffic having a traffic level, the
4 method comprising the steps of:
5 monitoring the traffic level on the input port;

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6 determining if the traffic level is near the total fixed amount of bandwidth
7 capacity;
8 if near, determining if the bandwidth user wishes to reroute overflow traffic;
9 if the bandwidth user wishes to reroute overflow traffic, determining if the
10 bandwidth user has selected a provider to handle overflow traffic; and
11 if the bandwidth user has not selected a provider to handle overflow traffic,
12 purchasing capacity to handle the overflow traffic when the traffic level exceeds the total
13 fixed amount of bandwidth capacity.

1 11. (previously presented) The method of claim 10 and further comprising the
2 steps of:
3 after capacity has been purchased to handle the overflow traffic, outputting a sales
4 notification; and
5 updating a list of sellers to indicate that capacity has been purchased in response
6 to the sales notification.

1 12. (previously presented) The method of claim 10 and further comprising the
2 steps of:
3 if the traffic level is not near the total fixed amount of bandwidth capacity,
4 evaluating bandwidth user instructions to determine if the bandwidth user wishes to sell
5 any unused capacity; and
6 when the bandwidth user wishes to sell excess capacity, updating a list of sellers
7 to indicate that capacity from the bandwidth user is available for sale.

1 13. (previously presented) The method of claim 11 and further comprising the
2 steps of:
3 if the traffic level is not near the total fixed amount of bandwidth capacity,
4 evaluating bandwidth user instructions to determine if the bandwidth user wishes to sell
5 any unused capacity; and
6 when the bandwidth user wishes to sell excess capacity, updating a list of sellers
7 to indicate that capacity from the bandwidth user is available for sale.

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1 14. (currently amended) A method for routing traffic from a start point to an
2 end destination, a plurality of bandwidth providers being connected to the start point and
3 providing service to the end destination, the method comprising the steps of:
4 continually measuring an amount of time required to send data to the end
5 destination on each of the bandwidth providers that provide service to the end destination,
6 wherein the continually measuring step includes the steps of:
7 outputting a ping to an identified site;
8 identifying a next site to be pinged; and
9 detecting when the ping from the identified site has been received;
10 statistically measuring the amount of time to form a measured response time; and
11 assigning each bandwidth provider to one of a range of response times based on
12 the measured response time.

1 Claim 15 (canceled).

1 16. (previously presented) A method for ranking a list of bandwidth providers
2 that provide service from a start point, the bandwidth provider including backbone
3 providers and bandwidth resellers, the method comprising the steps of:
4 identifying each backbone provider that provides service from the start point to an
5 end destination to form a list of backbone providers for the end destination;
6 removing backbone providers from the list of backbone providers when the
7 backbone providers indicate that usage-based capacity is not available for sale to form a
8 modified list of backbone providers;
9 forming a list of sellers from the modified list of backbone providers by adding
10 bandwidth reseller to the list when the bandwidth resellers have excess capacity on a
11 backbone provider on the list of backbone providers, and by updating the list of sellers
12 which have more or less capacity available due to a sale; and
13 ranking the list of seller according to a factor.

1 17. (previously presented) The method of claim 16 wherein the factor
2 includes cost.

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1 18. (previously presented) The method of claim 16 wherein the factor
2 includes response times.

1 19. (currently amended) A method for buying and selling Internet protocol
2 (IP) transit comprising bandwidth, the method comprising:
3 buying bandwidth in real-time from backbone providers;
4 selling bandwidth in real-time to users, wherein selling bandwidth in real-time to
5 users comprises:
6 selling fixed capacity bandwidth, wherein fixed capacity bandwidth
7 comprises fixed blocks of bandwidth, including multiple fixed blocks of bandwidth from
8 multiple backbone providers; and
9 selling usage-based bandwidth, wherein usage-based bandwidth comprises
10 bandwidth to handle bursts of traffic that exceed the fixed blocks of bandwidth; and
11 reselling bandwidth in real-time to users, wherein the bandwidth to be resold is
12 excess bandwidth previously purchased by users.

1 20. (previously presented) The method of claim 19 wherein users comprise
2 Internet service providers.

1 21 and 22 (canceled).

1 23. (currently amended) The method of claim 19~~claim 22~~, wherein selling
2 usage-based bandwidth comprises routing bursts of traffic from one of the multiple fixed
3 blocks of bandwidth that is at capacity to another of the multiple fixed blocks of
4 bandwidth that is not at capacity.

1 24. (currently amended) The method of claim 19~~claim 21~~, wherein selling
2 usage-based bandwidth comprises allowing the user to choose at least one backbone
3 provider to provide the usage-based bandwidth.

1 25. (currently amended) The method of claim 19~~claim 21~~, further comprising:
2 monitoring traffic on multiple backbone providers to determine a ranking of
3 backbone providers based on at least one factor, including a level of service; and

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4 wherein selling usage-based bandwidth comprises choosing at least one backbone
5 provider to provide the usage-based bandwidth based on the ranking.

1 26. (previously presented) The method of claim 25, further comprising
2 maintaining a list of backbone providers, wherein the list includes the ranking, and
3 wherein maintaining includes adding and removing providers based on bandwidth
4 availability, wherein the providers comprise bandwidth resellers.

1 27. (previously presented) The method of claim 25, further comprising selling
2 fixed block of bandwidth to users based primarily on the ranking.

1 28. (currently amended) The method of ~~claim 19~~claim 21, further comprising:
2 collecting transaction data in real-time, wherein transaction data comprises
3 information regarding actual usage of bandwidth;
4 generating charges for transactions;
5 generating billing statements for transactions; and
6 enabling payment for transaction to be made electronically.

1 29. (previously presented) The method of claim 28, wherein collecting
2 transaction data further comprises extracting packet headers and payload information.

1 30. (previously presented) The method of claim 28, wherein generating
2 charges for transactions further comprises consideration of:
3 type of application;
4 bandwidth allocated;
5 total bytes transferred;
6 time of day;
7 quality of service requested;
8 quality of service delivered; and
9 priority.

1 31. (currently amended) A method for buying and selling Internet protocol
2 (IP) transit comprising bandwidth, the method comprising:

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3 buying bandwidth in real-time from backbone providers, wherein buying includes
4 consideration of a quality of service offered by backbone providers;
5 selling bandwidth in real-time to users, wherein selling includes consideration of
6 the quality of service requested by users, and wherein selling bandwidth in real-time to
7 users further includes:
8 selling fixed capacity bandwidth, wherein fixed capacity bandwidth
9 comprises fixed blocks of bandwidth, including multiple fixed blocks of bandwidth from
10 multiple backbone providers; and
11 selling usage-based bandwidth, wherein usage-based bandwidth comprises
12 bandwidth to handle bursts of traffic that exceed the fixed blocks of bandwidth; and
13 reselling bandwidth in real-time to users, wherein the bandwidth to be resold is
14 excess bandwidth previously purchased by users.

1 32. (previously presented) The method of claim 31 wherein the quality of
2 service comprises a measure of time required to transmit data from a start point to a
3 destination.

1 33. (previously presented) The method of claim 31 wherein the quality of
2 service comprises at least one of a measure of time required to transmit data from a start
3 point to a destination, and cost.

1 34. (previously presented) The method of claim 31 wherein users comprise
2 Internet service providers.

1 Claims 35 and 36 (canceled).

1 37. (currently amended) The method of claim 31~~claim 35~~, wherein selling
2 usage-based bandwidth comprises routing bursts of traffic from one of the multiple fixed
3 blocks of bandwidth that is at capacity to another of the multiple fixed blocks of
4 bandwidth that is not at capacity.

1 38. (currently amended) The method of claim 31~~claim 35~~, wherein selling
2 usage-based bandwidth comprises allowing the user to choose at least one backbone
3 provider to provide the usage-based bandwidth.

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1 39. (currently amended) The method of claim 31~~claim 35~~ further comprising:
2 monitoring traffic on multiple backbone providers to determine a ranking of
3 backbone providers based on at least one factor, including a quality of service; and
4 wherein selling usage-based bandwidth comprises choosing at least one backbone
5 provider to provide the usage-based bandwidth based on the ranking.

1 40. (previously presented) The method of claim 39, further comprising
2 maintaining a list of backbone providers, wherein the list includes the ranking, and
3 wherein maintaining includes adding and removing providers based on bandwidth
4 availability, wherein the providers comprise bandwidth resellers.

1 41. (previously presented) The method of claim 39, further comprising selling
2 fixed block of bandwidth to users based primarily on the ranking.

1 42. (currently amended) The method of claim 31~~claim 35~~, further comprising:
2 collecting transaction data in real-time, wherein transaction data comprises
3 information regarding actual usage of bandwidth;
4 generating charges for transactions;
5 generating billing statements for transactions; and
6 enabling payment for transaction to be made electronically.

1 43. (previously presented) The method of claim 42, wherein collecting
2 transaction data further comprises extracting packet headers and payload information.

1 44. (previously presented) The method of claim 42, wherein generating
2 charges for transactions further comprises consideration of:
3 type of application;
4 bandwidth allocated;
5 total bytes transferred;
6 time of day;
7 quality of service requested;
8 quality of service delivered; and
9 priority.